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Antibiotic prescribing for children in general practice and adherence to treatment guidelines

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Introduction

-Over 80% of antibiotics are prescribed in primary care, mainly for viral respiratory tract infections (RTIs) in children. This irrational antibiotic use contributes to antimicrobial resistance, adverse drug reactions and increased healthcare costs.
-The Netherlands has comparatively low and stable antibiotic use. Yet, it is not always in accordance with recommendations and few studies have assessed adherence to RTI guidelines for children.

Study objectives

- Our study explores antibiotic prescribing patterns for fever, ear and respiratory infections in Dutch children in 2012.
- We aim to determine guideline adherence in antibiotic prescribing for specific pediatric RTIs and choice of antibiotics.
- We also intend to examine potential variations in guideline adherence among family practices and different age groups.

Methods

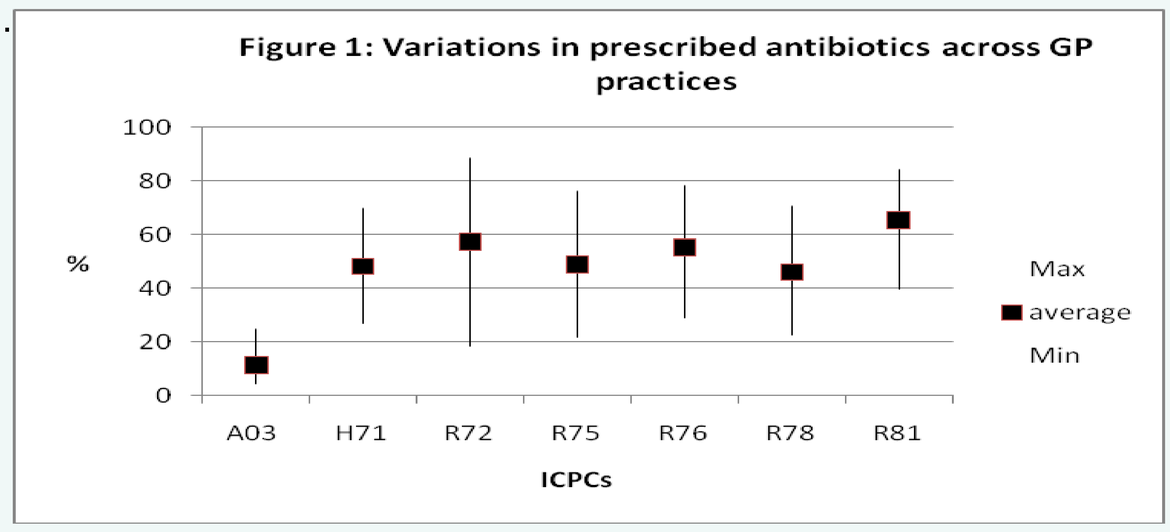
-We used NIVEL Primary Care Database, which collects data from routine electronic health records from Dutch general practices.
- Database contains info on patient age, dates of consultation and clinical diagnoses (ICPC-1), while prescriptions have drug name, prescribing date and drug amount.
- Sample size is drawn from children < 18 years receiving an antibiotic prescription (J01) or reporting fever, ear or RTI.
-We matched ICPC with clinical conditions from national guidelines (Table 1). One ICPC episode included all consultations with same health problems within a pre-set time frame.
-1st set of outcomes measure adherence to recommendations on whether or not to prescribe antibiotics for the diagnosis, and 2nd one evaluate antibiotic types prescribed.
-Outcomes are defined by disease-specific indicators for outpatient antibiotic prescribing.
-We calculated incidence rates for clinical condition and % of disease episodes treated with (recommended) antibiotics.
-- Multilevel analysis was performed to determine the variability in adherence to guidelines among different GP practices, taking into consideration patient characteristics, such as age and gender.
STATA 13.1 and SPSS 20.0 were used for statistical calculations.

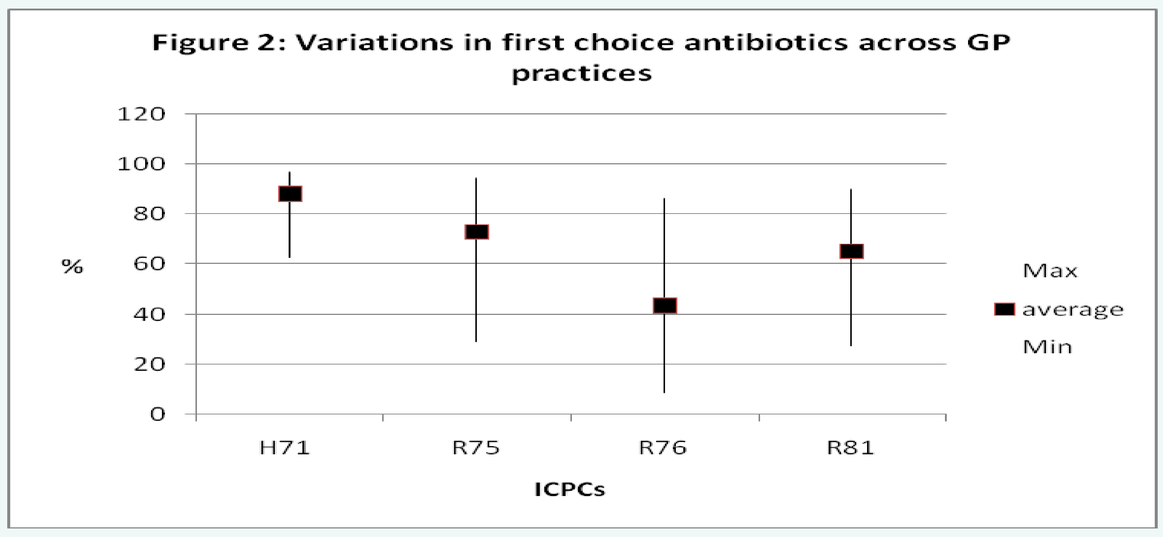
Table 1: National recommendations on AB use for specific ICPC

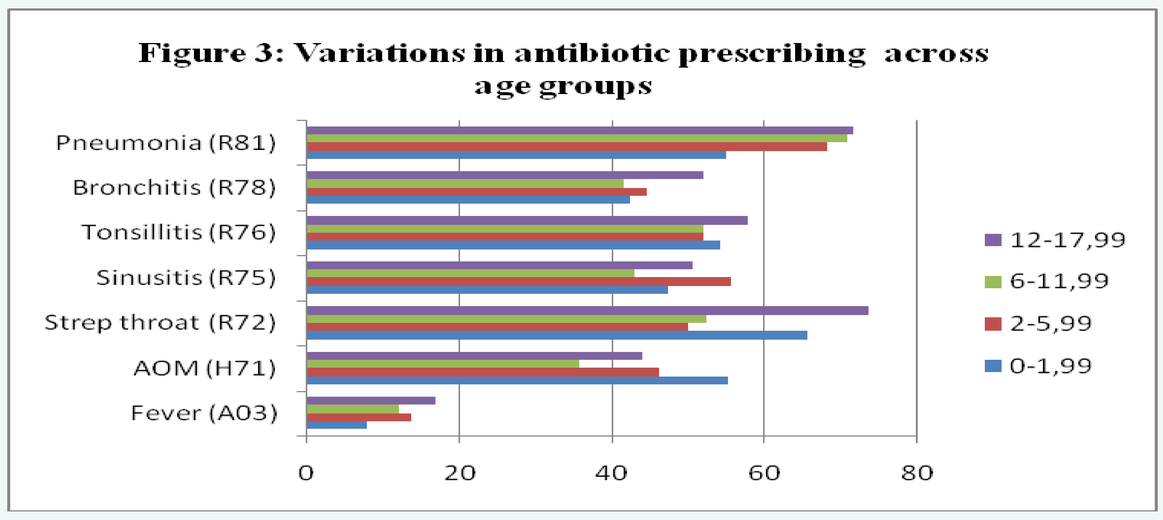
Diagnosis and ICPC	Antibiotic use	Recommended antibiotics
Fever - A03	No antibiotic use	
Acute otitis media (AOM) - H71	Restrictive use	1st choice: Amoxicillin (J01CA04) 2nd choice: Azithromycin (J01FA10) or Cotrimoxazole (J01EE01)
Pneumonia - R81	Antibiotic use for bacterial cause	1st choice: Amoxicillin (J01CA04) 2nd choice: Azithromycin (J01FA10)
Acute Bronchitis - R78	No antibiotic use	
Sinusitis - R75	Restrictive use	1st choice: Amoxicillin (J01CA04) or (J01AA02) 2nd choice: Azithromycin (J01FA10) or Erythromycin (J01FA01)
Strep throat - R72	Restrictive use	1st choice: Pheneticillin (J01CE05) or Phenoxymethylpenicillin (J01CE02) 2nd choice: Azithromycin (J01FA10) if persists: Amoxicillin - clavulanate (J01CR02) or Clindamycin (J01FF01)
Acute Tonsilitis - R76	Restrictive use	1st choice: Pheneticillin (J01CE05) or Phenoxymethylpenicillin (J01CE02) 2nd choice: Azithromycin (J01FA10) if persists: Amoxicillin - clavulanate (J01CR02) or Clindamycin (J01FF01)

Results

- 14,388 children from 101 practices received antibiotic prescription and/or reported ICPCs of interest.
- Most children suffered from AOM, while strep throat, sinusitis and pneumonia were the least frequent
- Antibiotic rates were >50% for pneumonia, strep throat, tonsillitis
- 40% of acute bronchitis and 10% of fever cases got antibiotic, even though its use is not recommended. (Figure 1)
- Recommended first line antibiotics were prescribed for 85% of AOM, 75% for sinusitis and 60% of pneumonia cases.
- Adherence to prescribing first line (narrow spectrum penicillins) was lowest for strep throat and tonsillitis. (Figure 2)
- Biggest variations across practices on whether to prescribe any antibiotic were seen for strep throat: ICC% = 20 (Figure 1)
- Practices differed over the choice of antibiotics mostly for sinusitis and tonsillitis: ICC% = 22 and 26 (Figure 2)
- Significant difference between ge groups on whether to prescribe any antibiotic for fever, AOM and pneumonia: p,= 0.05 (Figure 3)







Conclusions

- This study reports relatively low antibiotic use for pediatric fever, ear and RTIs in the Netherlands, with some variations across practices.
- Two aspects for concerns for non-adherence are:
- antibiotic treatment of certain viral infections not in line with guidelines
- use of broader spectrum antibiotics for strep throat and tonsillitis